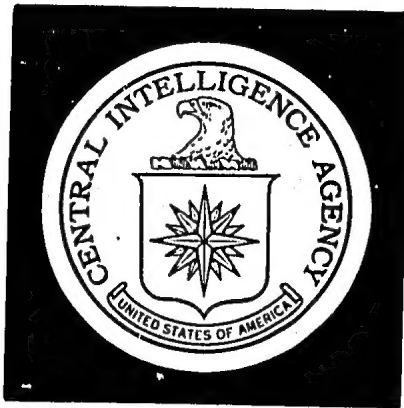


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**DIRECTORATE OF
INTELLIGENCE**

Intelligence Memorandum

Communist China: Comeback In Cotton Production

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
July 1971

INTELLIGENCE MEMORANDUM

COMMUNIST CHINA: COMEBACK IN COTTON PRODUCTION

Highlights

1. Production of raw cotton in Communist China rose rapidly in the 1950s to a peak of 1.75 million tons in 1958, plummeted in the early 1960s when cotton acreage had to be diverted to grain production, and recovered to the previous peak in the late 1960s (see the Chart).
2. The recovery in production has been the result of increased yields. (Acreage still remains about 25% below the acreage of the late 1950s.) More inputs – chemical fertilizer, better seed varieties, and improved water management – are responsible.
3. During the new Fourth Five-Year Plan period (1971-75) the need for increased food production will continue to constrain the acreage devoted to cotton. Nonetheless, more cotton will be required to clothe the threadbare population and enough additional inputs should be forthcoming to increase yields further. Plenty of unused capacity exists in the cotton textile industry itself so that production of cotton cloth can be increased without appreciable new investment.

Discussion

Background

4. Cotton – China's leading industrial crop – is by all odds the most important raw material for China's textile industry. Production of wool and silk textiles is only a fraction of the output of cotton textiles, and

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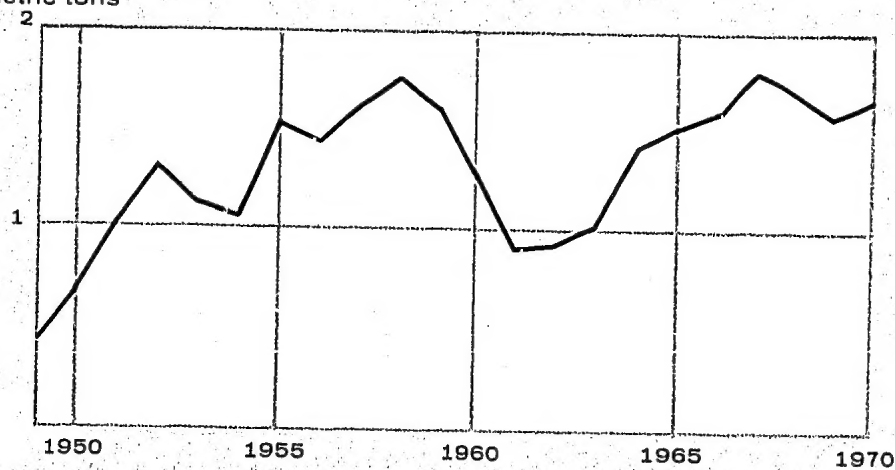
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**Communist China:
Cotton Producing Areas**



Cotton Production

Million
metric tons



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the production of synthetics is in its infancy. Cotton textile production has been barely sufficient to meet the nation's minimum requirements for clothing. 1/ The production of cotton itself has been constrained by low yields and by competition from food crops for the limited area of farmland suitable for cultivation. Poor grain harvests during the "disaster years" of 1959-61 forced the government to make drastic reductions in cotton acreage. Although acreage has never fully recovered, yields have increased, and current production of cotton is approximately equal to the former record level of the late 1950s. This memorandum surveys acreage, yields, and trends in production of cotton under the Communists and assesses future prospects for this leading industrial crop.

Cultivation

5. Cotton is grown in almost every agricultural region of China with the exception of the extreme north where cool temperatures prohibit its cultivation. The bulk of China's cotton acreage is concentrated in two regions: the eastern portion of the Yellow (Huang) River Valley and the central and eastern portions of the Yangtze River Valley (see the map and Table 1).

6. Despite the wide distribution of production, no region of the country has natural conditions that are ideal for the growing of cotton. The Yangtze Valley area and Szechwan Province have warm temperatures and ample rainfall, but drainage is inadequate on the diked fields so common in these areas. Furthermore spring and late summer rainfall often result in seed rot, damage to the mature cotton bolls, insect infestations, and interference with harvest operations. The seasonal distribution of rainfall is better in the Yellow River Valley. Here, precipitation -- normally concentrated in the summer months -- does not interfere with either planting or harvesting. Furthermore, the sunny, hot days during the maturation process are quite favorable for cotton growth. On the other hand, the pattern of precipitation is highly irregular; rainfall is frequently insufficient, giving rise to severe drought on non-irrigated land while heavy summer thunderstorms may inundate low-lying fields. In addition, frost frequently arrives before the bolls have matured.

Acreage

7. Historically, cotton was planted on the fields best suited for its growth in the Yangtze and Yellow River Valleys. Yields in the two regions

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Table 1

Communist China: Acreage of Cotton, by Province

	Thousand Hectares							
	1954	1955	1956	1957	1958	1963	1964	1965
Northwest China								
Shensi	285	300	288	321	317	247	282	267
Kansu	16	18	36	26	40	(30) a/	(30)	(30)
Sinkiang	54	74	123	114	129	120	138	152
Southwest China								
Szechwan	263	305	313	335	320	240	297	273
Yunnan	17	(10)	26	25	39	(20)	(20)	(20)
Kweichow	(20)	(20)	(20)	25	(20)	(20)	(20)	(20)
Central China								
Hunan	125	267	69	81	73	71	80	146
Hupei	593	567	567	583	444	467	526	533
Kiangsi	(40)	43	61	73	69	86	84	98
East China								
Kiangsu	667	700	667	723	583	543	590	546
Chekiang	78	80	(75)	73	69	78	80	80
Anhui	(200)	220	247	201	247	119	138	(110)
North China								
Hopeh	1,133	1,175	1,228	969	971	733	700	667
Honan	757	810	898	875	867	562	625	533
Shansi	283	313	333	343	308	216	259	260
Shantung	620	667	857	767	778	478	513	(610)
North East China								
Liaoning	(200)	145	210	195	206	67	113	123
Unspecified	111	59	238	47	243	--	--	--
Total b/	5,462	5,773	6,256	5,776	5,723	4,097	4,495	4,468

a. Data in parentheses are estimates.

b. Sum of the provinces for the years 1954-58 does not agree exactly with total acreage as reported in The Great Ten Years; Statistics on Economic and Cultural Construction Achievements of the People's Republic of China. The difference between sown acreages and harvested acreages, the need to estimate some provincial acreage, and the exclusion of limited amounts of cotton acreage in Kwangtung and Fukien account for this difference.

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were roughly comparable and conspicuously below the standards of such major producers as the United States and USSR. Communist agricultural policies in the mid-1950s, however, produced fundamental changes in these traditional planting patterns. First, production was expanded by enlarging the acreage of cotton in the Yellow River Valley. Second, in the Yangtze Valley, where the yield of grain is the highest in China, grain crops were substituted for cotton over a large area. From 1949 to 1955 the acreage of cotton in China increased from 2.8 million to 5.8 million hectares, chiefly by expanding acreage in the Yellow River Valley. With the exception of 1956 when a record 6.3 million hectares were sown by introducing cotton into areas with marginal growing conditions, cotton acreage remained at about 5.7 million hectares through 1958. At the same time, the acreage of cotton in the Yangtze Valley declined from 1.7 million hectares in 1955 to only 1.2 million hectares in 1958. This shift in the acreage of cotton enabled the Yangtze Valley to become a surplus producer of grain. However, in the Yellow River Valley – normally self-sufficient in the production of grain – the sharp increase in acreage of cotton led to a contraction in grain acreage and a consequent inability to produce enough grain for use of the population in the area.

8. The expansion of cotton acreage occurred primarily in Hopeh, Shantung, Shansi, Shensi, and Honan Provinces. Yields remained relatively stable despite the expansion of the acreage. 2/ The contraction of cotton acreage in the Yangtze Valley was accompanied by a doubling of yields between 1955 and 1957. Aside from the concentration of cotton cultivation on only the best quality fields, the increase in yield is attributed to the use of more organic and chemical fertilizers, which were just becoming available, and to the provision of better drainage. Furthermore, an American cotton variety, Delta Pineland No. 15 (DPL No. 15), was introduced into the Yangtze Valley. This variety was first grown in China in 1950 as part of the program of the UN Relief and Rehabilitation Administration (UNRRA), and by 1959 this variety had spread to about 60% of the total cotton acreage in China. Although this expansion took place primarily in the Yangtze Valley, DPL No. 15 was reportedly planted in some areas of Honan, Hopeh, and Shensi Provinces.

9. Poor management practices during the Great Leap Forward (1958-60) and unfavorable weather during the period 1959-61 resulted in

2. Normally there is an inverse relationship between acreage devoted to a crop and its average yield – that is, when acreage expands, yields usually decrease since the added acreage is usually of poorer quality. If acreage contracts, yields usually increase. In the case at hand, better water control appears to have been the most important factor offsetting the decline in yield that normally accompanies an expansion of acreage.

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a 20% cut in grain output and led to near famine conditions in China's major cotton-growing areas. As a result the government was forced to shift large areas of cotton land into grain production to feed the population. The shift from cotton was especially great in the Yellow River Valley where self-sufficiency in grain production had earlier been sacrificed to grow cotton. By 1962 the total acreage of cotton in China is believed to have dropped to 3.4 million hectares, about one-half of the acreage sown in the peak year of 1956. Aside from the harmful effects of poor weather, yields were also depressed by a shift in allocation of chemical fertilizer away from cotton to grain crops.

10. Following the favorable harvest of grain in 1962, the regime sought to restore the production of cotton by again expanding the acreage of cotton in the Yellow River Valley. The peasants were understandably hesitant to grow cotton in place of food for their own use. To placate the farmers the regime guaranteed a fixed grain ration to those production teams that specialized in growing cotton. However, severe flooding throughout the North China Plain in the fall of 1963 negated the 20% increase in the sown acreage of cotton and also made it impossible for the regime to fulfill its promise to supply grain to cotton growing teams.

11. In the fall of 1963 a *Jen-min Jih-pao* editorial noted that industrial crops had become a "striking problem throughout China." It was subsequently announced that in 1964 production teams in the Yellow River Valley were to grow enough grain for their own consumption, but that any land not required to grow staple foods must be sown to industrial crops, primarily cotton. In this area, persistently depressed levels of grain production made it impossible to restore cotton acreage to the levels of before the Leap Forward. To compensate for the shortfall in cotton acreage, more cotton was to be grown in surplus grain producing areas of the Yangtze Valley and in Szechwan Province. By 1965 the acreage of cotton in the Yangtze Valley had nearly returned to the level attained in 1955. In the North China Plain, however, the acreage of cotton in 1965 was about one-third less than 1955. Since 1965, China's acreage of cotton has averaged about 4.4 million hectares, or about one-fourth less than the 1955-58 average. The accompanying tabulation summarizes the major switches in cotton acreage.

Yields

12. During the period since 1964, cotton yields have increased rapidly and now have offset or more than offset the drop in acreage. Undoubtedly the expanded sowing of cotton on high-yield tracts in the Yangtze Valley has been a factor in the recent increase in yields. However, the bulk of the increase in cotton yields is the result of increased investment in

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Area	Thousand Hectares				
	1950	1955	1958	1962	1970
Yangtze River Valley	991	1,657	1,238	1,030	(1,370) <u>a/</u>
Yellow River Valley	1,806	2,872	2,863	(1,493)	(1,870)
Other	989	1,244	1,622	(877)	(1,160)
<i>Total</i>	<i>3,786</i>	<i>5,773</i>	<i>5,723</i>	<i>3,400</i>	<i>4,400</i>

a. Data in parentheses are subject to a wider margin of error.

agriculture by the regime. 3/ Pumps are now available to drain at least a part of the land sown to cotton. Although the percentage of the cotton currently irrigated is unknown, it clearly surpasses the 14% under irrigation in 1957. More chemical fertilizer is currently being allocated to cotton than in the past. For example, 1.26 million tons of chemical fertilizer was applied to cotton in 1968, compared with less than 600,000 tons in 1957. The effort to increase yields, however, has not been uniformly successful. Prior to 1957, yields in the Yangtze Valley and in the Yellow River Valley were approximately the same. By 1965, however, yields in the Yangtze Valley were double those in the Yellow River Valley. The mix of productive factors that can be mobilized in the Yangtze Valley provides much greater opportunities for improvement of yields.

Production

13. As indicated in Table 2, the regime's policies have been successful in restoring cotton production to roughly the 1957-59 level of 1.7 million tons. Average production in 1967 and 1968 equalled the record 1.75 million tons produced in 1958. In both 1969 and 1970, output has tailed off to about the 1.6 million ton level primarily because of less favorable weather conditions. Since acreage in the last few years has been far below the acreage of the late 1950s, the recovery of production has been the result of a roughly 25% increase in yield per hectare.

3. Starting in 1962, the government has arranged for large and increasing inputs into the agricultural sector, including fertilizer, insecticides, pumps, and other equipment.

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Table 2

Communist China: Acreage, Yield, and Production of Cotton

Year ^{a/}	Acreage (Million Hectares)	Yield (Kilograms Per Hectare)	Production (Million Metric Tons)
1949	2.0	165	0.44
1950	3.8	180	0.69
1951	5.5	187	1.03
1952	5.6	232	1.30
1953	5.2	225	1.17
1954	5.5	195	1.06
1955	5.8	262	1.52
1956	6.3	232	1.44
1957	5.8	285	1.64
1958	5.7	306	1.75
1959	5.6	285	1.60
1960	5.0	255	1.28
1961	3.7	244	0.90
1962	3.4	262	0.92
1963	4.1	251	1.03
1964	4.5	311	1.40
1965	4.5	333	1.50 ^{b/}
1966	4.5	355	1.60
1967	4.5	400	1.80 ^{c/}
1968	4.4	386	1.70
1969	4.4 ^{d/}	360 ^{e/}	1.58 ^{e/}
1970	4.4 ^{d/}	377	1.66 ^{f/}

a. Yield and production data for the period 1949-57, and acreage data for the period 1949-58 as reported in The Great Ten Years; Statistics On Economic And Cultural Construction Achievements Of The People's Republic of China.

b. Estimated. The claim was made at the Fifth Cotton Conference (held in March 1966) that 1965 was a record year. This claim is not believed valid because of generally poor growing conditions in 1965 and because the end-of-year economic report did not repeat this claim or claim an increase in cotton production.

c. The 1967 harvest was claimed to have been a record. Output was probably about 1.8 million tons.

d. Acreage is believed to have been relatively stable in 1969 and 1970.

e. Official press statement in early 1970 reported that about 3.33 million hectares of land is required to produce about 1.2 million tons of cotton. This implies a yield of 360 kilograms per hectare. 1969 production -- admittedly less than 1968 -- was obtained by multiplying the 1969 acreage by an average yield of 360 kilograms per hectare.

f. Provincial data suggest that 1970 production was about 5% greater than in 1969.

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14. The Cultural Revolution of 1966-69, which was predominantly an urban phenomenon, did not directly affect the production of cotton. For example, the policies toward cotton acreage and toward incentives in agriculture were not disturbed by the political upheavals. Inputs of fertilizer and equipment continued to flow into the agricultural sector; their volume, however, would have increased more rapidly in the absence of the Cultural Revolution. The production of cotton cloth, on the other hand, did suffer a 20% drop in 1967-68 because of the disruptions of the Cultural Revolution. Thus, stocks of raw cotton were built up in 1967-68. The high level of cloth production in 1970-71 rests in part on the use of these inventories. 4/

Outlook

15. The pressure on Chinese agriculture, caused by limited agricultural resources in relation to needs, will continue in the new Fourth Five-Year Plan period (1971-75). The increase in the production of food grains, which in the past six years has managed to stay slightly ahead of population growth, will continue to have first priority. This relegates cotton and other industrial crops to secondary status and tends to limit the amount of non-farm inputs allocated for their use. Thus, while total fertilizer supplies in China were six times as great in 1968 as in 1957, the amount of fertilizer allocated to cotton during this time span only doubled. Furthermore, the acreage devoted to cotton has continued to decline and has stagnated since 1967.

16. Nevertheless, cotton production is likely to increase over the next five years, given average weather conditions. Annual increases in chemical fertilizer, continuing improvements in water management, and the use of new seed varieties could lead to substantial increases in yields. The use of new seed varieties may be of particular importance because many older varieties commonly grown in China reportedly have degenerated badly in recent years. Many new varieties have been developed in the United States and elsewhere in the world and some of these varieties probably will end up in Communist China - for example, through seed exchange programs already existing between the United States and third countries. The use of these new varieties will significantly increase yields only if they are introduced in conjunction with other modern technological inputs. The regime currently is emphasizing the improvement of water control systems and is dispatching millions of middle school graduates to the countryside. The period since the Cultural Revolution has been marked by regularized planning and, at the same time, vigorous campaigns to raise the quantity and quality of production in all sectors.

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17. In general, these positive factors suggest that cotton production will rise in 1971-75 at least as fast as population. Although we have practically no details on the new economic plan, we know it calls for ambitious increases in production and we suspect that the goals for cotton and for cotton cloth are considerably above the expected rate of growth of population. China can use increases of this sort - present production is barely covering the population, and the people's expectations are running considerably ahead of this austere level. Finally, extensive unused capacity exists in the cotton textile industry, and therefore the government can provide for large increases in cotton textile output without incurring the usual costs of investment.

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